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LOW TEMPERATURE SOLDER CHIP ATTACH STRUCTURE AND  
PROCESS TO PRODUCE A HIGH TEMPERATURE INTERCONNECTION

ABSTRACT

A solder interconnection uses preferably lead-rich solder balls for making a low temperature chip attachment directly to any of the higher levels of packaging substrate. After a solder ball has been formed using standard processes, a thin cap layer of preferably pure tin is deposited on a surface of the solder balls. An interconnecting eutectic alloy is formed upon reflow. Subsequent annealing causes tin to diffuse into the lead, or vice versa, and intermix, thereby raising the melting point temperature of the cap layer of the resulting assembly. This structure and process avoids secondary reflow problems during subsequent processing.